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ANTHOPHORID BEES IN THE COLLECTION OF THE CALIFORNIA ACADEMY OF SCIENCES

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Centris atripes ferrisi Cockerell, new subspecies

Female. Resembles *C. atripes* Mocsary, but hair of thorax paler, of middle tibiæ on outer side very pale, nearly white, of hind tibiæ externally very pale brownish-grey, the large apical tuft very broadly dark brown; apex of abdomen with hair more or less pallid. Easily known from *C. rhodopus* Ckll. by the narrower face and dark legs.

La Paz, Lower California, June 29, 1919, 2 ♀ (G. F. Ferris).

CENTRIS TRICHOSOMA Cockerell

This is to be added to the fauna of California, four males having been taken by E. P. Van Duzee at Coachella, May 16, 1917.

EMPHOROPSIS MURINA Cockerell

Both sexes from San Francisco, California, April 20 (Van Dyke). This is certainly a species distinct from *E. murihirta*, to which I originally referred it as a subspecies. But for the fact that the male clypeus is entirely creamy white except for a rather narrow stripe on either lateral margin and the usual spots, instead of having a "subtrefoil mark," this might be referred to *H. miserabilis* (Cresson). Possibly *murina* and *miserabilis* are forms of one species, but this can only be determined by a larger series showing intergradation. The female has the face and scape entirely black. Unfortunately, the exact type-locality of *H. miserabilis* is unknown, but Fowler collected what he regarded as this species at San Francisco.

EMPHOROPSIS DEPRESSA (Fowler)

Nothing had been heard of this species since Fowler published it in 1899, but a female before me was collected by E. C. Van Dyke in the hills back of Oakland, April 16, 1911. The

species is easily known by the depressed tawny hair on the abdomen.

EMPHOROPSIS INTERSPERSA Cockerell

Two males, Mokelumne Hill, California, April (Blaisdell). Previously known only from a specimen labeled "California" without other data. These specimens differ from the type in having long white hair on the first ventral abdominal segment, and in one specimen white hair at the sides of segments 3 and 4. In one specimen the scape is all black; in the other it has a small white mark near base. The specimen with entirely black scape has the lateral face-marks deeply incised above, and is the one with the most white hair on abdomen beneath. The species is evidently variable, but the specimens must certainly be referred to *E. interspersa.* There is no light mark on mandibles.

CLISODON SYRINGÆ (Cockerell)

This was described in 1898 from males collected by Kincaid at Olympia, Washington, and has not been reported since. I have before me numerous specimens collected by Dr. E. C. Van Dyke at Meadow Valley, Plumas County, California (altitude 3500-4000 feet); a male June 8, 1924, females June 5 to 22, 1924. The female, hitherto unknown, differs from *C. terminalis* (Cresson) by the abundant black hair, that of the pleura being all black to black with a broad white band in front. The abdomen is black-haired on segments 2 to 4; legs black-haired with shining white hairs anteriorly on hind tibiæ and base of basitarsi; cheeks with black hairs.

It would be possible to regard this insect as a peculiar melanic race of *C. terminalis,* and as the latter is itself a race of the European *C. furcatus* (Panzer), the name would then be *C. furcatus syringæ.* There is, however, a similar form, *Clisodon norvegicus* (*Megilla furcata* var. *norvegica* Nylander) found in Norway and Lapland, which has generally been treated as a race of *C. furcatus,* but Strand has given apparently good reasons for considering it as a distinct species. The independent development of a melanic Clisodon in two regions so remote is a matter of interest.

ANTHOPHORA TEXANA Cresson

A female from Santa Monica, California, presented by F. C.

Clark. By the rufous tegulæ this falls with *A. texana,* but the separation of this from *A. californica* Cresson is uncertain.

ANTHOPHORA SODALIS Cresson

Female from Fremont National Forest, Klamath County, Oregon, June 18, 1922. Altitude, 5000 feet (Van Dyke). New to Oregon.

ANTHOPHORA WASHINGTONI Cockerell

Female from Atascadero, San Luis Obispo County, California, April 26, 1919 (Van Duzee).

ANTHOPHORA IGNAVA Cresson

Female: Lagunitas, Marin County, California, April 24, (Van Dyke).

ANTHOPHORA PACIFICA Cresson

Males: Lagunitas, Marin County, California, March 9, (Van Dyke); Mill Valley, Marin County, California, March 4 (Van Duzee). This is presumably the male of *A. ignava* as Fowler indicated, but biological observations are desirable.

Anthophora aterrima Cockerell, new species

Female (type): Length about 14 mm., anterior wing 11 mm.; black with entirely black hair, except that in certain lights a part of the hair on underside of abdomen shines reddish-golden, and there is a little pale hair at apex of middle tibiæ on outer side; tegulæ black; wings dilute brownish; mandibles bidentate.

Male less robust; hair nearly all black, white on face, long on upper part; on thorax all black varying to broadly pale reddish anteriorly; hind basitarsi with a strong thorn-like tooth, strongly bulbous basally. Clypeus, subclypeal band, space between clypeus and eye (concave above), labrum (except margin and spots), mark on base of mandibles and scape in front, cream-color. Third antennal joint short. The abdomen has a pair of widely separated apical spines, the interval between them broadly rounded.

Type, female, No. 1576, Mus. Calif. Acad. Sci., collected by Dr. E. C. Van Dyke, in June, 1924, at **Meadow Valley, Plumas County, California,** at 3500 to 4000 feet altitude. Paratypes, two males taken at same place, June 5 to 22, 1924.

Nearest to *A. pernigra* Cresson, from Nevada, but that has the fifth abdominal segment above covered with bright orange-fulvous hair. Possibly *A. aterrima* is a race of *pernigra,* which is known from a single female. It is remarkable that Meadow

Valley produces melanic forms of Anthophora and Clisodon. Do other insects (e. g., Lepidoptera) of that locality show melanic tendencies?

ANTHOPHORA STANFORDIANA Cockerell

Male: Shasta County, California, June 26 (J. A. Kusche). The pale hair on thorax and first two segments of abdomen is much lighter, less fulvous, than in typical specimens.

ANTHOPHORA URBANA Cresson

Female: Needles, California, December 5, 1921 (J. A. Kusche). Peculiar for the almost total absence of dark hair on thorax above, only a little showing on scutellum, but part of the thorax is denuded. The abdominal bands are very light and the hind margin of the segments broadly whitish.

SUBGENUS MICRANTHOPHORA Cockerell

Anthophora nigritula Cockerell, new species

Female. Length about 8 mm.; black with pale grey hair; on vertex, mesothorax (except margins) and disc of scutellum it is black; on thorax anteriorly is a transverse band of erect black hairs; broad lower margin of clypeus (not sending any projection upward), narrow supraclypeal band, labrum (except margin and the usual spots) and large patch on base of mandibles, all pale yellow; eyes bluish-green; antennæ dark, the flagellum obscure reddish beneath; cheeks with long white hair; tegulæ dark, with pallid margins; wings faintly brownish, nervures dark; spurs pale ferruginous; hair on inner side of hind tarsi black; abdomen covered with appressed pale grey tomentum, broadly bare at base of second segment except at sides; apical triangular area of fifth segment dark brown, rather obscure.

Type, female, No. 1575, Mus. Calif. Acad. Sci., taken by E. P. Van Duzee, July 18, 1919, altitude 7000 feet, at **Huntington Lake, Fresno County, California.**

In my key (Trans. Am. Ent. Soc., xxxii, pp. 66) this runs nearest to *A. anstrutheri* Ckll., but is much smaller with pubescence differing in many details, and the labrum conspicuously shorter, more truncate. The marginal cell is also shorter. The short pale labrum and other characters readily distinguish it from *A. curta* Provancher.

ANTHOPHORA CURTA Provancher

Male: Poway, San Diego County, California, April 2, (Blaisdell).

ANTHOPHORA FLEXIPES Cresson

Male: Huntington Lake, California, 7000 feet, July 8, 1919 (Van Duzee). Female. Strawberry Valley, El Dorado County, California, August 14 (Van Dyke).

ANTHOPHORA ANSTRUTHERI Cockerell

Female: Millbrae, San Mateo County, California, September 1 (Van Dyke).

XENOGLOSSA PATRICIA ANGUSTIOR Cockerell

Female: Sierra Madre, Los Angeles County, California (J. I. Carlson).

XENOGLOSSA ANGELICA Cockerell

Near Lodi, San Joaquin County, California, August (Blaisdell).

DASIAPIS OCHRACEA Cockerell

Male: San Diego, California (Blaisdell). Described from New Mexico.

DIADASIA NIGRIFRONS (Cresson)

Male: San Diego, California, April 19 (Blaisdell).

Diadasia australis mimetica Cockerell, new subspecies

Female. Length, 12-12.5 mm.; flagellum very obscure reddish beneath; thorax above with bright fox-red hair; tegulæ very dark, nearly black; wings greyish; second cubital cell narrow, oblique, parallel-sided, receiving recurrent nervure at about the beginning of its last third; third cubital cell longer than first, narrowed more than half to marginal; scopa of hind legs tawny reddish; hind spur strongly curved at end; first abdominal segment with pale ochreous hair, but no distinct bands; segments 2 to 4 with very sharply defined fulvous bands, only slightly narrowed sublaterally, the portion before the bands very black, with short black hair; fifth segment with long fulvous hair, greyish-chocolate at apex.

Type, female, No. 1577, Mus. Calif. Acad. Sci., taken by E. P. Van Duzee, May 16, 1919, on **Santa Cruz Island, California.** Paratypes, two females, same data.

Perhaps to be considered a distinct species, *D. mimetica,* but evidently derived from the *D. australis* stock. It has an extraordinary superficial resemblance to the Mexican *Ptilothrix sumichrasti* (Cresson), but is easily separated by the venation.

DIADASIA CRASSICAUDA Cockerell

Male: Poway, San Diego County, California, May 9 (Blaisdell). Differs from the type by the strongly ochreous tint of the pubescence.

Diadasia blaisdelli Cockerell, new species

Female. Length about 10.5 mm.; robust, black, covered with warm ochreous pubescence, becoming white beneath; face broad; eyes distinctly converging below; mandibles light ferruginous in middle; clypeus dull, somewhat shining toward apex, with coarse irregular punctures; flagellum dusky red beneath; mesothorax dull, without evident punctures, hairy all over; tegulæ large, rather pale dull reddish; wings dusky hyaline, stigma ferruginous, nervures fuscous; second cubital cell strongly narrowed above, receiving recurrent nervure not far from end; third cubital longer than first; small joints of tarsi clear ferruginous; scopa of hind legs very pale, ochreous-tinted; hair on inner side of hind basitarsi bright ferruginous; abdomen with long pale hair at base, otherwise densely covered dorsally with appressed yellowish-fulvous hair, bright ferruginous at end of fifth segment; ventral segments with double bands, the marginal one very pale, the one just before it consisting of light red hair.

Type, female, No. 1578, Mus. Calif. Acad. Sci., collected by F. E. Blaisdell, May 3, 1885, at **Poway, San Diego County, California.**

This cannot be the female of *D. crassicauda* because the marginal cell is conspicuously shorter and proportionately broader than in that species, and the stigma is larger. The second cubital cell is also differently shaped. In my key (Amer. Naturalist, xxxix, p. 742) it runs to *Dasiapis ochracea,* but is really quite distinct, differing by the hair on abdomen not so dense, the red color at end of fifth segment, the much longer hind knee-plate, the thicker and darker nervures, and the second cubital cell more contracted above. The eyes are narrower than in *D. ochracea.* When the male is known this species may have to be transferred to Dasiapis.

From *Diadasia laticauda* Ckll. this species is easily known by the dull clypeus.

DIADASIA BITUBERCULATA (Cresson)

Male: Sobre Vista, Sonoma County, California, May 12 (J. A. Kusche).

TETRALONIA LATA (Provancher)

Female: Hills back of Oakland, California, April 30 (Van Dyke).

TETRALONIA ROBERTSONI Cockerell

Female: Mill Valley, Marin County, California, April 21 (Van Duzee). *T. robertsoni* was described from Washington, D. C., but Baker took a specimen, which I could not separate from it, at Claremont, California. We now have another from Mill Valley. However, except for the absence of white hair on the abdomen (and I can see very minute traces of white at sides of third and fourth segments) the insect resembles *T. lata.* It is apparently what Fowler considered to be *T. acerba* (Cresson), of which Cresson states that the white hair on abdomen may be obsolete, but the dark wings distinguish it from true *T. acerba* from Nevada.

Where *T. robertsoni* flies in the Atlantic coast region there is no *T. lata;* it is possible that the Pacific Coast *"robertsoni"* is to be separated and is in fact a melanic form of *T. lata.* It is also possible that *T. lata* is a coast race of *T. acerba.* These questions must be settled by observers in California.

TETRALONIA ATRIVENTRIS (Smith)

Female: Park City, Utah, July 2, 1922 (Van Duzee). A species of the Eastern States, unexpected in Utah, but apparently the Utah insect is quite the same.

Melissodes calloleuca Cockerell, new species

Female. Length about 11 mm.; anterior wing nearly 9 mm.; hair of head and thorax above silky white, but posterior three-fifths of mesothorax and disc of scutellum bare, highly polished, with scattered punctures, the posterior middle of mesothorax almost without punctures; eyes bluish-green; facial quadrangle broader than long; clypeus rugose, shining and sparsely punctured above; flagellum, except at base, bright ferruginous beneath; cheeks with long white hair; tegulæ dark reddish with a tuft of pale hair; pleuræ with pale hair; wings brownish hyaline, stigma ferruginous, nervures fuscous; anterior and middle legs with brown hair, that on middle tibiæ more or less pallid on outer side; scopa of hind legs white, but rusty black on inner side of hind basitarsi; abdomen with three brilliant white hair-bands on segments 2 to 4, those on 3 and 4 broad and alike, that on 2 more or less failing in middle; dark parts of abdomen with short black hair, on apex of fifth segment and all of sixth

seal-brown; first segment with hind margin rufous; venter with dark brown hair.

Type, female, No. 1579, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, July 12, 1922, at **Saltair, Utah.** Paratypes: three females, same data as type and one female, Saltair, June 29, 1922. Very similar to *M. sphæralceæ* Ckll., but easily separated by the dark hair on inner side of hind basitarsi, and pure white abdominal bands, as well as the thoracic pubescence. In my key (with MS additions) it runs to the vicinity of *M. lavata* Ckll. ined., but is smaller and certainly distinct.*

In the published key *M. lavata* runs to the vicinity of *M. blakei* Ckll. and *M. mizeæ* Ckll., but is distinguished by the white hair of head and thorax above, and other characters.

Melissodes metenua Cockerell, new species

Female. Length about 9 mm., anterior wing, 7.5 mm.; black, with mainly black hair; facial quadrangle slightly broader than long; eyes bluish-green; hair of head coarse, entirely black; mandibles stout, with no inner tooth; clypeus dullish; strongly and densely punctured; supraclypeal area polished, impunctate in middle; front shining; flagellum dusky ferruginous beneath except at base; thorax with black hair, but dull white along anterior border of mesothorax and on metathorax posteriorly; mesothorax and scutellum shining, with weak punctures; tegulæ black; wings dusky, nervures dark; stigma very short, dark reddish; second cubital cell broad, receiving recurrent nervure not far from end; legs with mainly black hair, but middle tibiæ have a large wedge-shaped patch of white tomentum behind, and the long scopa on outer face of hind tibiæ is creamy-white; spurs brown; abdomen shining, with black hair at base; hind margins of first two segments rufescent; short oblique lines of white hair at sides of second segment; third and fourth segments with transverse bands of dull white hair; apex with dark chocolate hair. The tuft of hair on tegulæ is black.

Type, female, No. 1580, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, July 30, 1918, at **Colestin, Jackson County, Oregon.** The name means black hair in a Malay dialect. Resembles *M. hymenoxidis* Ckll., but has a narrower face and much more black hair.

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* **Melissodes lavata** was found by Dr. Lutz at Wray, Colorado, in August. The female is about 13 mm. long, anterior wings 10.3 mm.; head and thorax with long, white hair, wholly without black or fulvous; flagellum beyond second joint chestnut-red beneath; abdomen with pure white hair bands on segments 2 to 4, on 2 and 3 rather narrow, on 4 broad and entire. Differs from *M. glenwoodensis* Ckll. by the broader face, hair on outer side of middle tarsi light, brown tomentum covering concealed parts of abdominal segments, etc.

BEES OF THE GENUS ANDRENA IN THE COLLECTION OF THE CALIFORNIA ACADEMY OF SCIENCES

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ANDRENA NIGROCÆRULEA Cockerell

Females: San Francisco, California, April 11 (Van Duzee). Male: Berkeley, California, April 22 (Van Dyke).

ANDRENA MIMETICA Cockerell

Male: Chiricahua Mountains, Cochise County, Arizona, March 26, 27 (V. W. Owen).

ANDRENA MIMETICA FALLI Cockerell

Perhaps a distinct species; readily known from *A. mimetica* by the dusky wings. The following localities are all in California: Claremont, ♂ (C. H. Muzzall); Soboba Springs, Riverside County, June 5, ♂ ♀ (Van Duzee); Sobre Vista, Sonoma Co., June 12, ♂ (J. A. Kusche); South Sonoma County, June 22, ♀ (Kusche); Tallac, Eldorado County, August ♂ (F. E. Blaisdell); Bradley, Monterey County, May 23, ♂ (Van Duzee); Mount St. Helena, Napa County, June 9, ♀ (Van Duzee); Yosemite Valley, June 3, ♀ (Van Dyke).

ANDRENA PRUNORUM Cockerell

Male: Soboba Springs, Riverside County, June 5 (Van Duzee).

ANDRENA PRUNORUM ARIZONENSIS (Viereck and Cockerell)

Male: Santa Monica, California (F. C. Clark). This was based on a female from Oracle, Arizona, and was treated as a distinct species. It appears to be a form or race of *prunorum*, the male differing by its black abdomen, antennæ and femora. In the original description we said: "It is probably a race of *prunorum*."

ANDRENA SUBTRISTIS Cockerell

Female: San Francisco, California, April 20 (Van Dyke). Described from Los Angeles.

ANDRENA CANDIDA Smith

Female: Soboba Springs, Riverside Co., California, June 1 (Van Duzee).

ANDRENA CERASIFOLII Cockerell

Males: Vivian Park, Utah, July 7 (Van Duzee); Salt Lake City, Utah, July 1 (Van Duzee). Described from Santa Fé, New Mexico.

Andrena semicyanea Cockerell, new species

Female. Length about 15 mm., anterior wing, 11 mm.; head and thorax black with abundant pale hairs, very pale ochreous dorsally; on cheeks, face and pleura dull white; abdomen rich dark blue, dull, without evident punctures, without bands, but a little white hair at extreme sides of segments, forming a little patch on second; caudal fimbria dark reddish brown. Head broad, facial quadrangle very much broader than long; malar space linear; process of labrum pointed, with a round apical swelling; clypeus convex, finely and closely punctured, with a rather inconspicuous median raised line; front dull with a median keel; facial foveæ broad, seen from above white with a slight reddish tint, extending below level of antennæ; third antennal joint longer than next two together, but not as long as next three; flagellum very faintly brown beneath; mesothorax and scutellum dull, mostly hidden by hair; scutellum a little shining anteriorly; area of metathorax dull and minutely granular; tegulæ dark brown, very hairy; wings deep fuliginous; stigma dark brown, rather slender; second cubital cell broad, receiving recurrent nervure near middle; legs black, femora with long white hair; tibiæ with very dark brown hair; hair of tarsi paler, greyish brown, on inner side light reddish; spurs pale reddish; abdomen broad and rather flattened.

Type, female, No. 1581, Mus. Calif. Acad. Sci., collected by E. C. Van Dyke, May 16, 1909, on the hills back of **Oakland, California.** A very handsome species close to *A. subtilis* Smith, but separated by the dark wings and reddish black (instead of pale fulvous) hair on hind tibiæ.

Andrena carissima Cockerell, new species

Female. Length a little over 10 mm.; head, thorax and legs black, abdomen dark glaucous green, with the hind margins of the segments broadly dark purplish; hair of thorax above, including tubercles, very light ferruginous; of pleuræ and sides of metathorax white. Head broad, facial quadrangle much broader than long; hair of head dull white, thin on face, pale fulvous on vertex; malar

space very short; third antennal joint slightly if at all longer than next two together; flagellum very obscurely brownish beneath; clypeus dull and minutely granular above, the lower part closely punctured and shining, with a short subapical keel; facial foveæ broad; occupying about two-thirds distance between antennæ and orbit; seen from above light greyish brown, going a short distance below level of antennæ; mesothorax dull, without evident punctures; area of metathorax dull, without evident sculpture; tegulæ shining dark red-brown; wings greyish, stigma dusky red with dark margin, nervures fuscous; second cubital cell broad, receiving recurrent nervure near middle; femora with long white hair; tibiæ and tarsi with dark brown, hind tibiæ with long brilliant white hair in front; hind knees with dark hair; spurs light brown; abdomen shining, not evidently punctured under a lens (the microscope shows very fine scattered punctures), not banded; second segment depressed slightly more than a third of the visible part; caudal fimbria dark brown; ventral segments with thin fringes of long white hair.

Type, female, No. 1582, Mus. Calif. Acad. Sci., collected by J. I. Carlson, March 26, 1918, at **Clifton, Arizona.** Paratype, one female, same data. A very beautiful and distinct species, easily known by the color of the thoracic hair and metallic abdomen.

Andrena blaisdelli Cockerell, new species

Female. Length about 11.3 mm.; black, with the hair entirely black, except that it has a slight rusty tint on tarsi, and the caudal fimbria is dark chocolate; facial quadrangle much broader than long; clypeus covered all over with dense, small punctures, with no trace of a smooth line on ridge, only the middle of upper margin shining; malar space linear; process of labrum long, narrowly truncate, the apex thickened; third antennal joint longer than next two together; flegellum dark brown beneath; facial foveæ broad, very dark brown, going below level of antennæ; face with much outstanding hair; mesothorax and scutellum dull, the punctures minute; area of metathorax hardly defined, rugulose at base; tegulæ black, obscurely reddish posteriorly; wings brownish hyaline; stigma very dark reddish; second cubital cell of moderate size, receiving first recurrent nervure beyond middle, about as far from end as second recurrent from end of third cubital; spurs dark; abdomen shining, finely punctured, not banded, the hind margins of segments obscurely reddish; second segment depressed over a third, but less than a half.

Type, female, No. 1583, Mus. Calif. Acad. Sci., collected by F. E. Blaisdell, May 18, 1890, at **San Diego, California.**

Closely related to *A. subtristis* Ckll. from Los Angeles, but

smaller, and conspicuously differing by the broad, smooth hind margin of abdominal segments, the long erect (depressed in *subtristis*) hair of hind tibiæ, and the much more slender hind basitarsi. It is also related to *A. caliginosa* Vier. and *A. nigerrima* Casad.

ANDRENA SURDA (Cockerell)

Described (1910) as *A. hirticincta surda*, and hitherto only known from males collected in Colorado. A female collected at Paraiso Springs, Monterey County, California, September 29, 1922 (L. S. Slevin), certainly appears to belong to this same form, agreeing in everything except the sexual characters. It shows that we have to do with a quite distinct species, differing from *hirticincta* by being less robust, the hair at apex of abdomen yellow stained with red, and the hair of hind legs pale yellow. The broad middle tarsi are fringed with yellow instead of black hair; only the small joints of tarsi are reddened. The abdomen appears broadly black between the bands.

Andrena mesoleuca Cockerell, new species

Female. Length about 11 mm.; black, with black hair, except long white hair as follows: A tuft at each side of antennæ, margins of mesothorax broadly, tubercles, and to some extent on pleura, scutellum, post-scutellum and metathorax, and also first three dorsal segments of abdomen, except that on sides of third it is only white anteriorly and posteriorly. Facial quadrangle much broader than long; malar space well developed; process of labrum short and broadly truncate; clypeus shining, closely punctured, with a poorly defined smooth central band; facial foveæ black, going little below level of the antennæ; antennæ black, third joint about as long as next two combined; mesothorax dull, a little shining and with obscure punctures on disc; scutellum more shining; cheeks behind eyes highly polished; area of metathorax dull, triangular, rather small, defined by absence of the long hair; tegulæ black; wings dilute fuliginous, subhyaline, stigma dark rufous, nervures piceous; second cubital cell broad, receiving recurrent nervure far beyond middle; hair of face dark brownish; spurs dark; middle basitarsi broad; abdomen moderately shining, not evidently punctured.

Type, female, No. 1584, Mus. Calif. Acad. Sci., collected by E. C. Van Dyke, July 7, 1921, at **Yosemite Valley, California.**

Readily known by the striking black and white hair, but

allied to *A. milwaukeenensis* Grænicher, differing at once in the color of the pubescence, the sculpture of the clypeus, and the shorter antennæ. Allied also to *A. impuncta* Kirby.

Andrena microdonta Cockerell, new species

Male. Length about 9.5 mm.; robust, with broad head and abdomen; head and thorax with very long, pale ochreous hair, the color brightest on scutellum; face very broad, covered with hair, the visible surface at sides dull, but anterior orbits, from level of antennæ down, swollen and shining, ending below in a small but prominent tubercle or tooth; mandibles long and curved; malar space linear; clypeus broad and low; vertex dull, but a polished shining space above each eye; antennæ long, black, third joint as long as the two following together; mesothorax dull and granular, slightly shining on disc; scutellum dull; area of metathorax small, slightly shining, without evident sculpture; tegulæ black; wings slightly smoky; stigma lanceolate, pale dull amber, nervures fuscous; second cubital cell broad, receiving recurrent nervure about the middle; legs with pale hair, tinged with reddish on inner side of tarsi; spurs pallid; hind tarsi long, dark brown, polished, with only minute feeble punctures, no hair bands, apical tuft of hair very pale, with a yellowish tint; second segment depressed less than a third.

Type, male, No. 1585, Mus. Calif. Acad. Sci., collected by J. I. Carlson, March 26, 1918, at **Clifton, Arizona.**

Allied to the Californian *A. osmioides* Ckll., but easily separated by the polished abdomen and the position of the first recurrent nervure, which in *A. osmioides* joins the second cubital cell much before its middle. I had to consider whether *A. microdonta* could be the male of *A. carissima* Ckll., and while it is possible that this is the case, the probabilities seem against the reference, so I have described it as distinct.

Andrena yosemitensis Cockerell, new species

Female. Length about 10 mm.; head, thorax and abdomen shining dark blue, legs black; facial quadrangle somewhat broader than long; clypeus convex, black (except at sides), the disc highly polished, with very strong sparse punctures; process of labrum rather narrowly truncate; malar space linear; hair of head and thorax thin, entirely black, except a few long, pale hairs at extreme sides of scutellum; facial foveæ very dark chocolate, going below level of antennæ; third antennal joint about as long as next two together; flagellum very obscurely brownish beneath; mesothorax and scutellum shining, but very finely roughened, with scattered minute punctures; mesopleura dullish, fine dark blue; area of metathorax

merely minutely roughened; tegulæ dark brown; wings dusky, suffused with brown throughout; stigma narrow-lanceolate, reddish with a dark margin; nervures dark fuscous; second cubital cell receiving recurrent nervure in middle; legs with black hair, scopa on hind tibiæ appressed, hind basitarsi stout; abdomen shining, finely roughened, but not evidently punctured under a lens, the first two segments very smooth; second segment very narrowly depressed only about a quarter of length of segment; no hair bands; apical tuft thick, black.

Type, female, No. 1586, Mus. Calif. Acad. Sci., collected by E. C. Van Dyke, June 12, 1921, in **Yosemite Valley, California.**

Related to *A. nigrocærulea* Ckll., but easily known by the clypeus, black hair on thorax above, etc. Possibly this is identical with *A. chapmanæ* Viereck, which has never been properly described, but *chapmanæ* is placed in the series with third joint of antennæ decidedly longer than four and five together (in *yosemitensis* it appears about equal to the eye, but measured is found to be as 22 to 20), and is said to be 12 mm. long. By inference we are led to understand that only the abdomen of *A. chapmanæ* is blue.

Andrena epileuca Cockerell, new species

Female. Length, 9 to 11 mm.; head, thorax, and abdomen dark blue, clypeus and legs black; pubescence black except on thorax above where it is clear white, and there are some long, white hairs on first abdominal segment; facial quadrangle somewhat broader than long; clypeus shining, closely and rather finely punctured all over, without a smooth line; malar space linear; process of labrum large, very broadly triangular; facial foveæ narrow, black, hardly going below level of antennæ; front striate; third antennal joint longer than next two together; flagellum very obscurely brownish beneath; mesothorax and scutellum dull, without evident punctures under a lens; area of metathorax dull, without evident sculpture; tegulæ very dark brown; wings dilute fuliginous, stigma dark reddish, nervures piceous; second cubital cell receiving recurrent nervure at middle; hair of tibiæ and tarsi shining, more or less brown in certain lights; hind basitarsi robust; spurs dark; abdomen shining, finely roughened, without distinct punctures; no hair bands; second segment depressed about third; apical tuft black.

Male. Length about 7.5 mm.; slender, head not particularly broad, nor cheeks enlarged; long hair on lower part of cheeks and on pleura pallid but not white, nor is that on thorax above white, but rather pale dusky yellowish; abdomen dorsally with thin, white hair, becoming black toward apex; hair of legs pallid. There is

much long, black hair at sides of face and on upper part of cheeks. The upper part of the clypeus is green. One specimen carries a Stylops.

Type, female, No. 1587, Mus. Calif. Acad. Sci., collected by E. C. Van Dyke, May 8, 1910, on the hills back of **Oakland, California.** Other females are from South Sonoma County, California, April 16 and 23 (J. A. Kusche); Forks, Clallam County, Washington, July 5 (E. C. Van Dyke); Pismo, California, April 25 (E. P. Van Duzee). The males are from the hills back of Berkeley, California, March 7 (Van Dyke).

Closely related to *A. nigrocærulea* Ckll., but easily known by the shining clypeus. It is, perhaps, no more than a race, as a female from Santa Cruz, California, June 2, 1919 (Van Duzee), has the clypeus dullish and appears to be intermediate. Typical *nigrocærulea* has the hair on thorax above pale ochreous, in the Santa Cruz specimen referred to it is white. The male is distinctly different from that of *A. nigrocærulea* by the shining clypeus, black hair all over face, and mandibles more or less reddened at apex. Presumably the two species visit different flowers, but as to this we have at present no information.

Andrena lustrans Cockerell, new species

The type of *A. nigrocærulea* and *A. epileuca* has given rise to still another segregate which (female) has white hair on the thorax above as in *epileuca,* but differs at once from both the others by the shining steel blue mesothorax and scutellum, with sparse minute punctures. The process of labrum is broadly truncate, and the second abdominal segment is depressed less than a third. The clypeus is shining and punctured essentially as in *A. epileuca,* its upper part metallic. The third cubital cell is broader on marginal than in *A. nigrocærulea.* The occiput has white hair, and in the specimen from Fallen Leaf Lake, apparently only a variety, the hair of upper part of pleura, cheeks, and face (excepting clypeus) is whitish. The male is unknown.

Type, female, No. 1588, Mus. Calif. Acad. Sci., collected by Dr. E. C. Van Dyke, June 12, 1924, at **Meadow Valley,** Plumas County, **California,** at 4000-5000 feet altitude. Paratypes: Keen Camp, Riverside County, California, June 6-12, 1917 (Van Duzee); Mokelumne Hill, California, April

(Blaisdell); Fallen Leaf Lake, Lake Tahoe, California, July 13 (Van Dyke); Steen Mountains, Harney County, Oregon, June 25 (Van Dyke). This species averages smaller than *A. nigrocærulea.*

Andrena supervirens Cockerell, new species

Female. Length, 9-9.5 mm.; head and thorax dark blue, abdomen bluish-green; antennæ and legs black; facial quadrangle conspicuously broader than long; clypeus with upper half green, lower half black, and rose color between; surface of clypeus dull, minutely rugulose, without distinct punctures and with no smooth line; process of labrum broadly truncate; orange hairs projecting below mandibles; facial foveæ very narrow, warm reddish, going only a little below level of antennæ; third antennal joint to next two together as 25 to 20; hair of face mixed black and dull white, of vertex black, of occiput and cheeks white; malar space small; thorax with thin, long, white hair; mesothorax, scutellum and area of metathorax dull, without evident sculpture; tegulæ dark brown; wings hyaline, only faintly dusky; stigma light dull reddish with dark margin; nervures brown; second cubital cell rather large, receiving recurrent nervure a little before middle; femora with white hair beneath; tibiæ and tarsi with brown hair, hind tibiæ with dull white hair in front; hind basitarsi broad; spurs pale reddish; abdomen with a sericeous luster, not evidently punctured; apical depressions of segments steel-blue; second segment depressed rather more than a third; traces of very thin white hair bands at sides of third and fourth segments; caudal tuft pale chocolate-brown. The dorsum of abdomen has very thin erect white hair.

Type, female, No. 1589, Mus. Calif. Acad. Sci., collected by Dr. E. C. Van Dyke, May 8, 1910, on hills back of **Oakland, California.** Paratypes from Fairfax, Marin County, April 13 (Van Duzee); South Sonoma County, California, April 26 (J. A. Kusche); Melrose, Alameda County, California, April 2 (Van Duzee); San Luis Obispo, California, April 24 (Van Duzee); Muir Woods, Marin County, California, May 4 (Van Dyke); hills back of Berkeley, California, March 7 (Van Dyke).

Variety **aurescens** new variety. Head and thorax dark green; abdomen bright yellowish-green, with golden tints; the depressed hind margin of segments bluish-green. Type, No. 1590, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, April 13, 1919, at **Fairfax,** Marin County, **California.**

This looks like another species, but it certainly is only a variation.

This is another species of the same alliance as those just described, but more distinct by the green or bluish-green satiny abdomen, abundant long white hair, etc.

Typhlusechus. This genus was created by Linell in 1897 to receive an interesting new blind Tenebrionid (Ent. News, Vol. VIII, p. 154), two specimens of which were collected in Los Angeles County, California, by Mr. Albert Koebele. It has since been taken by other collectors. A number of years ago Mr. Charles Fuchs gave me a specimen from the type locality. Another has recently been taken by Mr. Vasco M. Tanner which seems to differ in several characters from *singularis* Linell. In this the basal prothoracic impression is stronger and deeper, and is limited laterally by distinct prominences; the prothorax is rather more elongate and its sides, with those of the elytra, are more explanate. It may represent a new species unless the sexes differ. At any rate, it is very interesting to learn that a species of the present genus is found so far east.—F. E. Blaisdell.

Valgus californicus Horn. In July, 1907, I took two specimens of this rare California Sacrabæid, one at the Calaveras Big Trees, elevation 4702 feet, and one at Blood's Meadow, Alpine County, elevation 7000 feet. Both were taken from the nests of termites, one in a stump and the other beneath bark of a dead pine, four feet from the ground. This note may help others to obtain the species.—F. E. Blaisdell.

NORTH AMERICAN SPECIES OF THE GENERA SPHÆROCERA AND APTILOTUS (DIPTERA-BORBORIDÆ) *

BY ANTHONY SPULER
Pullman, Washington

Dr. Frederick Hendel divides the genus *Sphærocera* into two distinct genera, *Allosphærocera* and *Sphærocera* (Wien. Ent. Zeitg. 38, 1-3, 1920). According to Hendel in *Allosphærocera,* the antennæ are widely separated at base, the epistoma is broad, flat, and shield-shaped, with sharp lateral margins, the notum and scutellum have granular processes which give rise to small, short hairs, and the scutellum has distinct tubercles at the margin. In *Sphærocera* the antennæ are not widely separated at base, the epistome is small and does not extend to base of antennæ, the notum and scutellum are smooth and the margin of scutellum is without tubercles. Hendel places such species as *pusilla* Fallén, *coronata* Zetterstedt, *denticulata* Meigen and *hyalipennis* Meigen in the genus *Allosphærocera,* and the species *subsultans* Fabricius in the genus *Sphærocera.* The writer has several specimens of the species *S. bimaculata* Williston and finds that this species does not fit either group. In *S. bimaculata* Williston, the antennæ and epistome show a structure midway between the two groups, the notum and scutellum are smooth as in Hendel's genus *Sphærocera,* but the scutellum has two distinct tubercles which would place it in the genus *Allosphærocera.* Since this species seems to be intermediate between the two genera established by Hendel, the writer feels that the old genus *Sphærocera* Latreille should be retained and the three groups regarded as subgenera. For the third group represented by the species *S. bimaculata* Will. the writer proposes the subgeneric name *Parasphærocera.*

This paper is one of a series on the family Borboridæ.

Genus SPHÆROCERA Latreille

Latreille: Hist. Nat. Ins. Crust. XIV, 394 (1804).
Duda: Tijd. Entom. LXIII (1920).
Hendel: Wien. Ent. Zeitg. XXXVIII, 1-3 (1920).
Black to brown flies. Head hemispherical; face usually produced,

* Contribution from the Division of Entomology of the Washington Agricultural Experiment Station, State College of Washington.

more or less excavated beneath the antennæ; antennæ short; third joint rounded; arista long and bare; front broad, without bristles; vibrissæ present; eyes rounded, usually on lateral protuberances. Mesonotum devoid of bristles, scutellum short and broad, posterior margin rounded, usually with small tubercles, never with bristles. Abdomen moderately long and broad. Legs strong, the hind pair elongated; hind tibiæ usually with an apical spur; hind metatarsi incrassate, as long as or longer than the second joint. Wings longer than abdomen; fourth and fifth veins complete and reaching the margin of wing; third vein not branched; third and fourth veins parallel or divergent; outer cross-vein near wing-margin and much longer than inner; second basal and anal cells distinct.

Genotype: *Musca subsultans* Fabricius.

Subgenera and species of *Sphærocera.*

1. Inner cross-vein very short; abdomen with large yellow spots on dorsum; legs yellow, notum and disc of scutellum smooth; posterior margin of scutellum with two distinct tubercles, one on either side.....n. subgen., **Parasphærocera**
   Genotype, and only American species, ***bimaculata*** Will.
   Inner cross-vein normally long; abdomen without such spots 2
2. Antennæ narrowly separated at base; epistome small, not extending to base of antennæ; notum and scutellum smooth, margin of scutellum not tuberculate; subgen. *Sphærocera* Lat. 3
   Antennæ widely separated at base; epistome broad, flat, and shield-shaped, with sharp lateral margins; notum and scutellum with granular processes, which give rise to small, short hairs; margin of scutellum tuberculate; subgen. *Allosphærocera* Hendel 4
3. Hind tibiæ with a long apical spur; front, face, and cheeks opaque black; dorsal segments of abdomen margined with yellow; second segment one and one-half times third; legs short, hairy. Fig. 2.....*subsultans* Fabr.
   Hind tibiæ devoid of a long apical spur, legs black, with trochanters, knees, apices, of tibiæ and tarsi yellow; posterior margin of scutellum without tubercles or bristles; hind metatarsi thicker than tibiæ, longer than the next two, but not as long as the next three..... *annulicornis* Mall.
4. Third and fourth veins more or less convergent toward tip; first posterior cell noticeably narrowed; legs entirely yellow; posterior margin of scutellum with faint traces of tubercles; arista two times width of front; hind metatarsi swollen, one and one-fourth times as long as second joint....*pallipes* Mall.
   Third and fourth veins not convergent toward tip..... 5
5. Legs entirely black; inner cross-vein distinctly before basal third of discal cell; scutellum with very strong marginal tubercles; notum with four distinct rows of tubercles; disc

of scutellum tuberculate; front with two divergent rows of minute tubercles. Fig. 3.....*scabra*, n. sp.

Legs varying from almost entirely yellow to black with coxæ, trochanters and knees yellow; notum without distinct tuberculate rows; marginal tubercles of scutellum less pronounced; inner cross-vein at or slightly beyond basal third of discal cell. Fig. 4.....*pusilla* Fall.

SPHÆROCERA (PARASPHÆROCERA) BIMACULATA Williston (Fig. 1).

Williston: Trans. Ent. Soc., Lond. 1896, 435. Pl. XIV, f. 165 (1896).

(St. Vincent)

Numerous specimens from Florida (U. S. N. M.), Monteserrat, Trinidad, W. I. (Busck) and La Suiza de Turrialba, Costa Rica (Schild).

SPHÆROCERA (SPHÆROCERA) SUBSULTANS Fabricius (Fig. 2)

Fabricius: Spec. Ins. II, 444 (1871). (*Musca.*)
Duda: Tijd. Entom. LXIII, 16 (1920).
Hendel: Wien. Ent. Zeitg. XXXVIII, 1-3 (1920).

Forty specimens of this species from the following localities: Washington: Clarkston (Melander); Pullman (Mann). California: Claremont (Metz); Berkeley Hills (Cresson). Illinois: (Ill. Univ.); Algonquin (U. S. N. M.). Missouri: St. Louis (Warner). Pennsylvania: Swarthmore, Lansdale (Cresson). Vermont: Lyndon (Melander). Massachusetts: Boston (Melander). Washington, D. C. (Coquillett).

SPHÆROCERA (SPHÆROCERA) ANNULICORNIS Malloch

Malloch: Proc. U. S. N. M. XLIV, 363 (1913).

Described from Massachusetts.

SPHÆROCERA (ALLOSPHÆROCERA) PALLIPES Malloch

Malloch: Ent. News, XXV, 31 (1914).

Described from Panama.

Sphærocera (Allosphærocera) scabra Spuler, new species (Fig. 3)

Opaque black. Front depressed, rugulose, broader than long; anterior outline of front strongly produced in center; orbital stripes irregularly tuberculate; interfrontal stripes extending to vertex, with a row of distinct tubercles; ocellar tubercle pronounced; eyes on

prominent lateral processes of the head; face strongly produced between and below antennæ; labrum very large, projecting downward; antennæ widely divergent; second joint much larger than third; third joint slightly browned, arising from the deeply concave apex of the second joint; arista very thin and hair-like, two and one-half times antennal length, entirely bare; antennæ resting in deep grooves of the face; cheeks slightly shining; more than one-half as high as eye; lower posterior portion minutely tuberculate. Mesonotum short and broad, with four distinct rows of tubercles; posterior portion of mesonotum with some tubercles in between the four rows; scutellum rectangular with the posterior margin rounded; disc tuberculate; posterior margin with eight very strong tubercles. Legs entirely black, devoid of bristles; hind femora rather long and slender; hind tibiæ with a distinct spur at apex; hind metatarsi thicker than the tibiæ at apex, as long as the much thinner next two joints. Wings slightly browned; wing-veins dark brown; costa bare, first section one-half as long as second, third and fourth sections equal and a little less than one-third as long as second; inner cross-vein at distinctly before basal third of discal cell; basal section of third vein three-eighths as long as penultimate section of fourth vein, and but little longer than outer cross-vein; fifth vein reaching margin of wing; third and fourth veins decidedly diverging at tip; second section of fourth vein much shorter than the last section. Abdomen very broad; dorsum slightly shining, with large ovoid, slightly gray-dusted opaque spots on second, third, and fourth segments; hypopygium large. Halteres yellow. Length, 3 mm.

Type: Male; South Bend, Washington, May 23, 1917 (Melander).

Sphærocera (Allosphærocera) pusilla Fallén

Fallén: Dipt. Suec. Heterom. 8 (1920). (*Copromyza.*)
Duda: Tidj. Entom. LXIII, 29 (1920).
Hendel: Wien. Ent. Zeitg. XXXVIII, 1-3 (1920). (*Allosphærocera.*)

The writer examined over forty specimens of this species from the following localities: Washington: Pullman (Mann); Kettle Falls, Clarkston, Kamiac (Melander). Idaho: Kendrick and Chatcolet (Melander). British Columbia: Nelson (Melander); Kalso (Caudell). Massachusetts: Beverly; Cambridge (Burgess). Illinois (Coquillett, Ill. Univ.). Washington D. C. (Coquillett).

Genus Aptilotus Mik.

Mik: Wien. Ent. Zeit. XVII, 206 (1898).
Strobl: Dipt. Steierm. IV, 276 (1898).

Head broad; eyes prominent; the broad cheeks with a single vibrissa; the very broad front with two pairs of decussate bristles;

ocelli present; antennæ short, with the first joint hardly visible, the second and third equal, the latter subreniform, with a long, slender dorsal arista; face carinate; epistome prominent. Mesothorax a little broader than long, nearly rectangular, no transverse suture; a rather deep depression behind the scutellum, which is broad, somewhat convex, margined behind and with four marginal bristles. Wings and halteres completely wanting. Abdomen elliptical, above and below convex, constricted at the base; second segment hardly longer than third, dorsal sclerites turned down, forming a ridge along the sides; without a connecting membrane; male abdomen with six segments; the hypopygium asymetrical, the greater part sunken; female abdomen with seven segments, the last two short, seventh very short and transverse. Legs rather strong, nearly destitute of the stronger bristles, bearing a stronger short bristle at tip of the hind tibiæ, hind metatarsi somewhat dilated and abbreviated. (Translation.)

Genotype: *Aptilotus paradoxus* Mik.

The only species of *Aptilotus* described from North America are *A. borealis* Malloch, and *A. politus,* Williston.

Species of Aptilotus.

Front and face subopaque; cheeks slightly more than one-half eye-height; second segment of abdomen very slightly longer than third; scutellum two-fifths as long as mesonotum....*borealis* Mall.

Front and face glossy black; cheeks considerably more than one-half eye-height; second segment of abdomen distinctly longer than third; scutellum at least one-half as long as mesonotum ..... *politus* Will.

Aptilotus politus Williston

Williston: Dipt. Death Valley Exped. 259 (1893). (*Apterina.*)
Mik: Wien. Ent. Zeitg. XIX, 71 (1909). (*Apterina.*)

Originally described from Death Valley, California, and not since encountered.

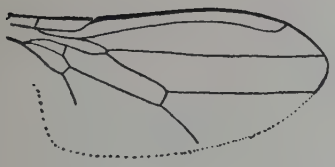
Aptilotus borealis Malloch

Malloch: Proc. U. S. N. M. XLIV, 361 (1913).
Aptilotus politus Coquillett: Proc. Acad. Sci. Wash. II, 464 (1900).

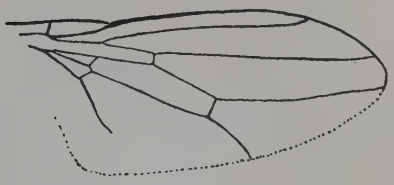
Twenty-four specimens distributed as follows:

Wyoming: National Park (U. S. N. M.). Oregon: Astoria (U. S. N. M.). Montana: Bear Paw Mts. (U. S. N. M.). Washington: Seattle (Kincaid); Bellingham (Melander).

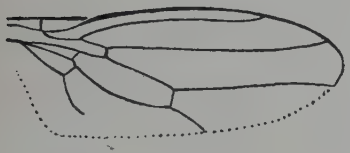
Professor Kincaid obtained his specimens in skunk cabbage (*Lysichiton camtschatcense*).



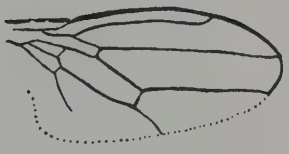
1. S.bimaculata



2. S.subsultans



3. S.scabra



4. S.pusilla

Spuler — Genus Sphaerocera

Eurytrachelus platymelus typhoniformis Nagel

A NEW FORM OF LUCANOID COLEOPTERA

BY PAUL NAGEL
Hanover, Germany

(Figure on preceding page)

Eurytrachelus platymelus Saund. var. **typhoniformis** n. var.

Mas: Niger; totum corpus (mandibulis exceptis) ut in Eurytr. platymelo. Mandibulæ læviter in medio, ac fortiter ante apicem incurvatæ, dente minuto anteapicali et ab medio fere ad apicem lamina subdenticulata instructæ; forma laminæ hujus ut in *Eurytr. titanus* Boisd. var. *typhon* Boil.

	Capitis	Prothoracis	Elytrorum	Mandib.
Longitudo	9 mm.	9.5 mm.	21 mm.	14 mm.
Latitudo	16.5 mm.	18 mm.	16 mm.	4 mm.

Patria: Yunan, China meridionalis.
Femina ignota.

This curious specimen was sent to me for determination by Mr. E. R. Leach of Piedmont, California. At first I believed it a new species, but after having examined it carefully I can find no differences between it and *Eurytr. platymelus* Saund. except the form of the mandibles. They are not so broad as those of *platymelus* and have behind the middle a large, broadly truncate, tooth with four to five small tips or serrations. The large basal tooth of *platymelus* has disappeared and the row of eight to ten small teeth, succeeding it in the species, has shrunk to four or five small teeth which form the inner edge of the tooth-like projection in the variety. All other parts of the body are completely comformable in color, form, and structure with *Eurytr. platymelus*.

Hitherto we knew this shrinking of the row of inner teeth only in *Eurytr. titanus* Boisd. var. *typhon* Boil. (Naturaliste, XXVII, 1905, p. 17, fig. ♂); that it occurs in yet other Lucanoid species we observe in the new form of *platymelus*.

Type, male, from Yunan, China, in the collection of Mr. E. R. Leach.

NORTH AMERICAN SPECIES OF PARAPHROSYLUS BECKER, A SUBGENUS OF APHROSYLUS WALKER

BY M. C. VAN DUZEE
Buffalo, N. Y.

Dr. Theodore Becker, in his large work on North and South American Dolichopodidæ, published in 1921, page 127, establishes Paraphrosylus a new subgenus of Aphrosylus to receive the American species of that genus, separating them from the European, or typical forms, by several characters, the two most important of which are the presence of well-developed acrostichal bristles in the American species, and the supposed difference in the form of the face and front, but he seems to have been misled in the latter character by Dr. Wheeler's figure of the head of *prædator,* published in the Proceedings of the California Academy of Sciences, third series, Vol. 1, plate iv, fig. 4. This figure gives a wrong view of the face and front of our species; the face of *prædator,* and of all the rest of our species, is narrowed just below the antennæ, there being more or less of an emargination in the orbits of the eyes opposite the base of the antennæ, as in the European species; the front also widens as usual, being widest at the vertex. This leaves the presence of the acrostichal bristles as the only character of importance to separate the subgenus, these bristles being wholly wanting in the European forms; still it seems to me that this character is enough to justify our acceptance of the subgenus.

Three new species are described below. One, our largest form, was taken by Dr. Aldrich in Alaska, and the other two were taken by E. P. Van Duzee, in the Lower California region.

I am greatly indebted to Dr. Aldrich for the privilege of examining the material in the National Museum, which contains all three of Wheeler's species, as well as the new form from Alaska.

Table of Species

Males

1. Posterior cross-vein forming an obtuse angle with the basal portion of fourth vein, arista pubescent (California)..... .....*grassator* Wheeler

Posterior cross-vein nearly at right angles to the fourth vein; arista bare 2

2. Wings dark brown, with a conspicuous spot of darker color, which is nearly square and extends from the cross-veins towards the base of the wing (California)..... *direptor,* Wheeler
Wings without such a spot, at most with a little clouding along the cross-vein 3

3. Outer hypopygial appendages yellow (Gulf of California)..... *tenuipes* new species
Outer hypopygial appendages blackish..... 4

4. Fore femora with short, blunt, erect spines below on basal half (California; British Columbia) ..... *prædator* Wheeler
Anterior femora with rather long hair below..... 5

5. Wings blackish; third and fourth veins slightly divergent towards their tips; middle femora with two rows of slender bristles below (Alaska)..... *nigripennis* new species
Wings more brownish; third and fourth veins considerably convergent towards their tips; middle femora with one row of longer hairs on lower posterior edge (Gulf of California)..... *fumipennis* new species

Females

1. Posterior cross-vein forming an obtuse angle with the basal part of fourth vein..... *grassator* Wheeler
Posterior cross-vein at nearly right angles to the fourth vein..... 2

2. Wings with a nearly square spot of darker color, extending from the cross-vein towards the base of the wing..... *direptor* Wheeler
Wings without such a spot, at most with a little clouding along the cross-vein 3

3. Third vein bent backward, convergent with fourth towards their tips..... *fumipennis* new species
Third and fourth veins nearly parallel or slightly divergent towards their tips..... 4

4. Large species, 4.5-5 mm.; wings blackish..... *nigripennis* new species
Smaller species, 2.5-3 mm.; wings more brownish..... *prædator* Wheeler

Paraphrosylus prædator, Wheeler, has the joints of fore tarsi as 25-14-12-8-10; of middle ones as 38-17-11-7-9; the joints of hind tarsi are as 34-25-14-8-11. The length of the last section of fifth vein of the wing is 19, of cross-vein 17/50 of a millimeter.

Paraphrosylus direptor, Wheeler, has the joints of the fore tarsi as 20-10-8-7-10; of middle ones as 35-15-9-6-12; and of

the posterior as 34-22-11-7-11. The length of the last section of the fifth vein is 22, of the cross-vein 19/50 of a millimeter.

Both these species have the third and fourth veins nearly parallel beyond the cross-vein, or a very little divergent, so they are slightly farther apart at tip than at the cross-vein; in both the third and fourth veins are a little bent backward at their tips.

1. **Paraphrosylus nigripennis** Van Duzee, new species

Male. Length 3.5-4 mm., of wing 4.6 mm. Face wide, black, with only a little gray pollen. Palpi and proboscis velvety black, the former with a little grayish pollen on the extreme edge and numerous stiff black hairs. Antennæ black; third joint nearly twice as long as wide, tapering to a point; it has, besides the usual minute hairs, a few short spines; arista apical, longer than the antennæ, slender, bare, except the basal joint, which has a few minute hairs and is a little thickened. Eyes not, or but slightly, emarginate opposite the antennæ. Front widest at the vertex, opaque black. Orbital cilia black; lower part of the head with rather long black hairs, one pair near the proboscis longer than the others.

Thorax dark green; dorsum dulled with blackish-brown pollen and with a darker median line; acrostichal bristles rather small and scattering; four quite large dorsocentral bristles in each row; three humeral bristles, one post humeral, one præsutural, one notopleural, one supraalar and four scutellar bristles; pleura without bristles, except six hair-like ones above fore coxa, its pollen grayish. Abdomen dark green with blue reflections and brown pollen, its hairs black. Hypopygium large for the genus, basal portion with numerous small black hairs; outer appendages long, black, bent upward at nearly a right angle a little beyond their middle and with numerous stiff, spine-like hairs; at their base are two somewhat round, large, yellowish-brown lamellæ, with a few small hairs on the edge; inner appendages short, black, with a few minute white hairs at tip.

Coxæ, femora and tibiæ black; fore and middle coxæ with long, black hair on the anterior surface, but without bristles at tip. Fore femora thickened, with rather long, black hair, especially on lower posterior surface; middle femora with two rows of slender bristles on lower surface; hind femora bowed outward, the hairs on their anterior surface quite long. Fore and middle tibiæ each with one small, slender bristle not far from base; posterior ones with several small bristles on upper surface, these bristles not much more than hairs, about twice as long as those on the tibiæ. Tarsi plain; fifth joint a very little widened, pulvilli rather large, yellowish. Joints of fore tarsi as 36-15-12-8-14; those of middle ones as 47-19-13-8-11;

of hind tarsi as 50-34-16-10-15. Calypters black, yellow at base, with black cilia. Halteres wholly yellow.

Wings wholly and uniformly quite black; the cross-vein bordered with a slightly darker shade; third and fourth veins nearly straight, slightly wider apart at tips than at the cross-vein.

Female. Length, 4-4.5 mm.; of wing, 5-5.5 mm. They agree with the male in color and in the wing venation; the face is a little wider and has a greenish reflection; the third antennal joint is somewhat shorter and the middle femora are without bristles below. Ovipositor with several blunt, upturned spines on upper edge, and below these a pair of short lamellæ, rounded apically and with two hairs at tip.

Described from three males and five females, taken at Seward, Alaska, July 26, 1921, by J. M. Aldrich.

Type, male, in the United States National Museum.

2. **Paraphrosylus fumipennis** Van Duzee, new species

Male. Length, 2.5-3 mm.; of wing, 3 mm. Face black with thin, white pollen, moderately wide. Palpi black with stiff black hairs. Proboscis dull black. Antennæ black; third joint a little longer than wide, pointed at tip; besides the usual little hairs with several small spines; arista apical, slender, bare, except on the basal joint which is a little thickened, longer than the antennæ. Eyes slightly emarginate opposite the antennæ. Front a little green, dull, widest at the vertex. Orbital cilia black; lower part of the head with a few small black hairs.

Thorax blackish with slight purple reflections, covered with brown pollen; acrostichal bristles in an irregular row, conspicuous; four large dorsocentrals on each side; two humeral, one post-humeral, one præsutural, one intraalar, and four scutellar bristles; pleuræ with a pair of bristles placed close together a little below and in front of the halteres and two small slender bristles above the fore coxæ. Abdomen but little depressed, green with black hairs and white pollen. Hypopygium black with pale hairs; its lamellæ brown or black, short, rather slender, nearly straight, fringed with hairs.

Coxæ, femora, tibiæ and tarsi black. Fore coxæ with a few small black hairs, without bristles at tip. Fore femora thickened on basal portion, tapering to their tips, with a row of hairs below which scarcely reach the tip. All femora and tibiæ without bristles, except one hair-like one on middle tibiæ near the base and several similar ones on hind tibiæ; these are scarcely more than hairs, and are about twice as long as the rest on the tibia; middle femora with a row of longer hairs on lower posterior edge. Last joint of all tarsi slightly flattened and widened. Joints of fore tarsi as 28-18-12-8-9; of middle ones as 37-20-12-9-9; those of hind tarsi are as 33-25-13-

9-9. Calypters yellow with a brown border and black cilia. Halteres yellow.

Wings grayish, without spots; third vein bent backward, approaching fourth at tip; last section of fifth vein about one and a half times as long as the cross-vein.

Female. Almost like the male except that the face is wider, more brown, and the eyes are not emarginate.

Described from eleven males and nine females, taken on San Esteban Island, Gulf of California, April 20, 1921, and Isla Partida, Gulf of California, April 22, 1921, by E. P. Van Duzee.

Type, male, No. 1590, and allotype, female, No. 1591, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, April 20, 1921, on **San Esteban Island, Gulf of California.**

3. **Paraphrosylus tenuipes** Van Duzee, new species

Male. Length, 2.2 mm.; of wing, 2.5 mm. Face narrow, covered with white pollen. Palpi black with a little brown pollen and stiff black hairs. Proboscis shining black, dulled around the edge with brown pollen. Front black, widest at the vertex. Antennæ black; third joint moderately long, pointed at tip, with the usual minute hairs and several little spines; arista apical, slender, longer than the antenna, bare except at base. Eyes emarginate opposite the antennæ. Orbital cilia black.

Thorax greenish; dorsum dulled with brown pollen; the acrostichal bristles rather large, appearing to be in a single row, four pairs of dorsocentrals, one humeral, one post-humeral, one notopleural, and one intraalar bristle; also two quite conspicuous bristles placed close together on the pleuræ below and in front of the halteres, and three slender bristles above the fore coxæ. Abdomen depressed, green with black hairs and white pollen on the sides. Hypopygium yellowish brown, almost as long as the sixth abdominal segment, with stiff hairs on the upper and posterior surfaces; its lamellæ rather slender, yellow, about as long as the hypopygium, nearly straight, projecting downward in the type, fringed with hairs.

Coxæ, femora, tibiæ, and tarsi brown; fore coxæ with a few minute hairs on anterior surface, without bristles at tip. Fore femora thickened on basal half, abruptly narrowed below near the middle, with a row of rather long hairs on basal half below. All femora and tibiæ without bristles, their hair rather long. Fifth joint of all tarsi and third and fourth joints of middle ones, slightly widened. Joints of fore tarsi as 26-14-12-8-7; of middle pair as 36-19-18-11-13; of posterior pair as 31-25-13-10-10. Most of the tarsal joints, especially those near the tip, appear a little bent; this is caused by their being a little thinned in the middle or before the tip.

Halteres yellow. Wings grayish, without spots on the veins; last section of fifth vein about one and a half times as long as the cross-vein.

Type, male, No. 1592, Mus. Calif. Acad. Sci., collected by E. P. Van Duzee, April 20, 1921, on **San Esteban Island,** Gulf of California. Described from the unique type.

Among the Coleoptera which have recently established themselves in California are the following:

Carabus nemoralis Mull. A common European species, which was first found in Golden Gate Park, San Francisco, about five years ago, and which is now well established there, was probably introduced with plants imported from the Eastern Atlantic States, where it has been well established here and there for many years.

Sphæridium scarabæoides Linn. A common European dung-feeding Hydrophilid. This was introduced into Eastern North America many years ago, appeared in the Northern Pacific States but a few years ago, and within the last two years has been found in a number of widely distributed places in Northern and Central California.

Aphodius fimetarius Linn. A common European dung beetle; established in Eastern North America for a long period, in Washington and Oregon for at least twenty-five years, yet only reported last year in Northern California.

Cryptorhynchus lapathi Linn. A destructive European willow and poplar boring weevil. This last spring it was found in small numbers by Mr. F. J. Spruyt infesting young poplars in the Maclaren nurseries in San Mateo County. It is hoped that this species will soon be eradicated—E. C. Van Dyke.

A NEW SPECIES OF ADELGES (HEMIPTERA, PHYLLOXERIDAE)

BY P. N. ANNAND
Stanford University, California

As has been pointed out by students of the Hemiptera, the type of the genus *Chermes* is apparently *Chermes ficus* Linnæus, which is a species belonging to the family commonly known as the Psyllidæ. Consequently, another generic name must be found for the Aphidoid genus *Chermes*. Without here going into the nomenclatorial problems involved, it appears that the next available name for this genus is *Adelges* Vallot, 1836, which was erected for *Adelges laricis* Vallot, this being synonymous with the species now accepted as *Chermes abietis* Linnæus.

Adelges tsugæ Annand, new species

Fundatrix spuria (Fig. *J*). Length (flattened on the slide) 1.04 mm., width .76 mm., width of thoracic shield .52 mm. Dorsal plates of the prothorax fused to form a shield on which are three so-called "spinal" pore areas, one "pleural" area toward the posterior margin, and one elongate "marginal" area. The shield is continuous with a ventral plate which partially surrounds the base of the antennæ and which bears a large pore area. Dorsal pore plates of the meso- and metathorax distinct except in a few cases where the spinal and pleural plates are fused into one. Mesothorax with a fourth pore plate outside each coxa and a fifth near the meson ventrally. Metathorax with this fifth plate present, but without the fourth. Venter of the thorax with a pair of heavily chitinized furcæ present on meso and metathorax. First abdominal segment with three dorsal plates; second and third with three dorsal plates, one just ventrad of the spiracle and another near the meson on each side ventrally; segments four to six, inclusive, without the median ventral plates; segment seven, lacking all but the spinal and pleural plates. A large post-anal plate (Fig. *I*) is present. All the coxæ with heavily chitinized pore plates. Wax pores on all the plates small and abundant, surrounded by a considerable, chitinized, non-pore-bearing area. Posterior extension of the abdomen, which bears the ovipositor, without plates, but with numerous small, knobbed setæ (Fig. *K*) which are distributed as shown in Fig *J*. Abdominal spiracles present on segments two to six, inclusive.

First stage larva of colonici (Fig. *A*). (This is the larva from the egg of the fundatrix spuria on *Tsuga heterophylla.*) Length (flattened on the slide) .36 mm., width .24 mm. Dorsal plates of head and prothorax separate. Plates of the head fused to form a single

large plate on each side of the median line, this extending ventrad nearly to the base of the antenna and bearing a single row of pores along the mesal and lateral margins. Prothorax covered by two plates which bear pores disposed in the same manner. Mesothorax with "spinal" and "pleural" plates fused, the "marginal" plates distinct, the plate formed by the first two with a row of pores along the mesal and lateral margins. Metathorax and the abdominal segments up to and including the fifth with three distinct plates; sixth abdominal segment with "spinal" and "pleural" plates only; seventh with "spinal" plates only; pores are present on the mesal margin of the "spinal" plates of the metathorax, on first to fourth abdominal segments, and on the lateral margin of the marginal plates on the second to fifth abdominal segments. Venter without plates. In the case of newly hatched larvæ the plates are but lightly chitinized and are apparently smooth except for two or three furrows which radiate from the base of the single, centrally located seta. On the cast skin of a first-stage larva (Fig. *C*) distinct reticulations are apparent, particularly on the meso- and metathorax. Antennæ (Fig. *B*) three-segmented, with the third segment about four times the length of the second. Legs (Fig. *D*) comparatively large, with two long setæ arising from the first tarsal segment and two knobbed setæ on the second. Spiracles not distinguishable on the abdomen, but perhaps present as unchitinized openings.

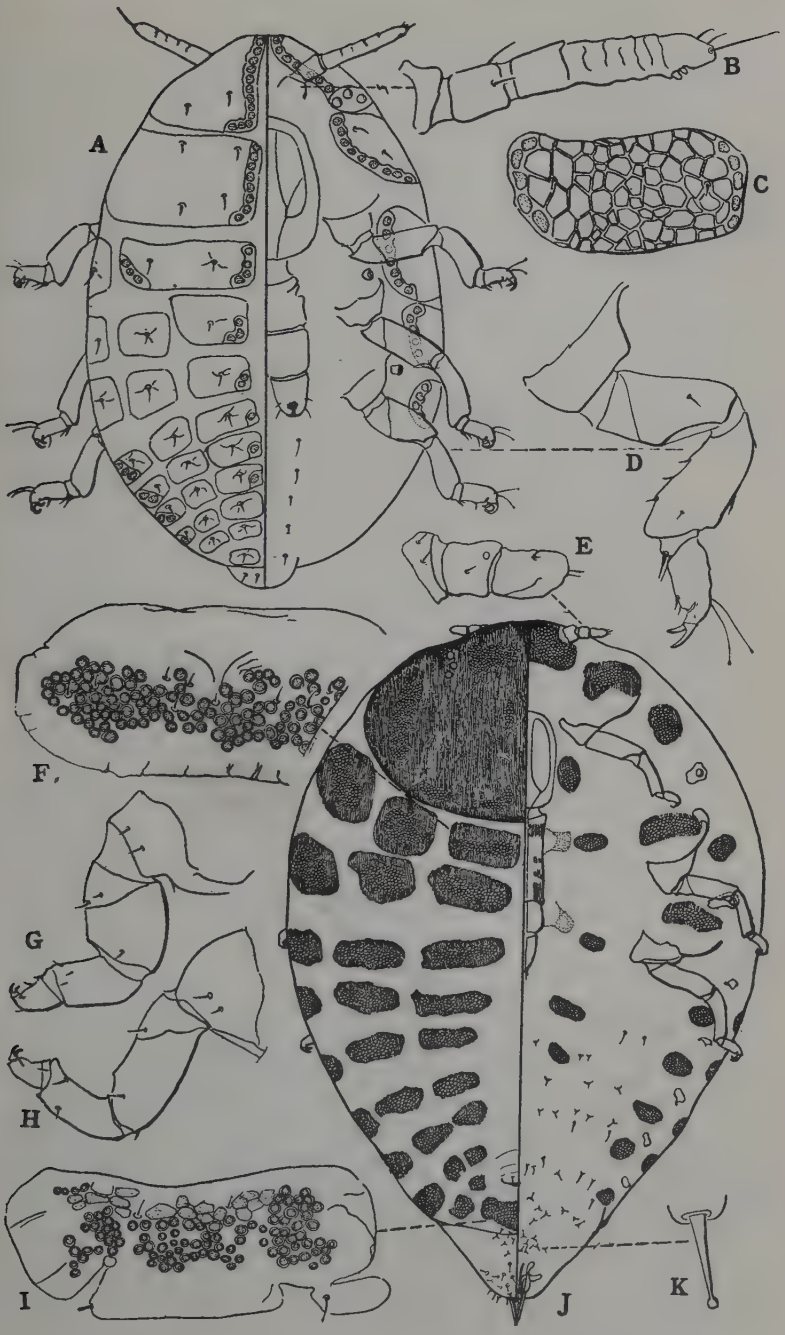
Second stage larva of colonici. Length (flattened on slide), .48 mm.; width, .32 mm. Wax pores and plates distributed as in the fundatrix. Plates not as heavily chitinized and proportionately smaller than in the fundatrix. Legs very short and thick. Abdominal spiracles present as in fundatrix.

Third stage larva of colonici. Length, .73 mm.; width, .58 mm. Very similar to the second stage except that the plates are now heavily chitinized and the legs somewhat heavier, the posterior femur (Fig. *G*) being nearly as wide as long.

Adult colonici. Without marked differences from the fundatrix spuria except a slightly smaller size and slightly lighter chitinization.

Holotype and paratype mounts in the Stanford University collection. Type locality, Eugene, Oregon, from *Tsuga heterophylla*. The species has been taken also from the same host in the following localities: Fort Bragg, California (C. D. Duncan and from herbarium specimen); Portland and Eugene, Oregon (J. S. Boyce); Mt. Hood, Oregon (P. N. Annand). The primary host, if any exists, is unknown.

This species is readily distinguishable from the others in the genus by the pore distribution in the first stage larva, the large pore plates with small pores, the knobbed abdominal setæ of the adult and the distinct thoracic shield.


A
B
C
D
E
F
G
H
I
J
K

Notes on Biology and Habits

All the stages observed feed on the bark of *Tsuga heterophylla,* secreting an abundant, cottony wool. Where observed on Mt. Hood the insect in a few cases appeared sufficiently abundant to cause considerable damage, and the leaves of the infested twigs showed the effects of the insects' work. In this instance they were more abundant on the higher branches, fifteen to twenty feet from the ground. Egg-laying is well under way by April 15, as material collected on that date at Eugene, Oregon, included a few first and second stage larvæ, as well as many eggs. According to my observations the bark of the twigs only, to the exclusion of the larger branches, is attacked. The alate forms are unknown.

Caption for Figure

(See page 81)

Adelges tsugæ Annand, new species: A, first stage nymph of colonici; B, antenna of the same; C, plate formed by the fusion of the spinal and pleural plates of mesothorax, from cast skin of first stage nymph; D, posterior leg of first stage nymph; E, antenna of fundatrix spuria; F, plate from dorsum of fundatrix spuria; G, posterior leg of third stage nymph of colonici; H, posterior leg of fundatrix spuria; I, post-anal plate of fundatrix spuria; J, fundatrix spuria; K, knobbed seta from ventral side of fundatrix spuria.

Calosoma subæneum Chaud. It will interest coleopterists to learn that two specimens of this beautiful and rare species exist in collections on the Pacific Coast, one in the collection of Dr. E. C. Van Dyke, the other in my own. These specimens were taken in Fresno County by Mr. Baron, and evidently were given by him to G. W. Harford of Alameda. Later, Mr. W. M. Giffard of Honolulu acquired the Harford collection and very kindly placed these specimens in Dr. Van Dyke's and my collections. As far as I know, the species has not been taken in recent years and, like *Elaphrus viridis,* is apparently a lost species.—F. E. Blaisdell.

NEW FORMS OF CONIONTIS (COLEOPTERA)

BY FRANK E. BLAISDELL, SR.
San Francisco, California

During the past few years certain species of *Coniontis* have become of economic interest, as they have been found to injure garden crops. I am indebted to Mr. Roy Campbell of the Experiment Station at Alhambra, California, for several interesting phases of *Coniontis* and *Blapstinus;* also, to Mr. Louis Slevin of Carmel, Monterey County, and Mr. Warwick Benedict of Santa Monica, for specimens taken at Carmel and vicinity of Point Conception.

A general review of the species of *Coniontis* is being prepared, with the view of establishing the status of many of the described phases so that they can be more intelligently dealt with in the field. At the present time I shall make known one new species and two races.

Coniontis globulina ventura Blaisdell, new variety

In the Entomological News of January, 1918, page 9, I described *Coniontis muscula* as a race of *globulina* Casey, and on page 14 discussed the peculiarities of *globulina.* At the present time it is quite evident that the intermediate phase between *globulina* and *muscula* should have a distinctive name. This is of practical importance from the economic standpoint on account of the growing importance of understanding the relation of the Coniontis phases to each other, as they have been found injurious to young beans and beets. The following varietal definition of *ventura* is now given:

Form elongate suboblong-oval, parallel as compared to *muscula,* and strongly convex. Color dark nigro-piceous; legs and antennæ rufous, at times somewhat darker; surface lustre rather dull. Pubescence fine, rather abundant, decumbent but not hiding the entire surface, moderately easily removable and pale flavate in color, varying more or less from paler to deeper yellow; conspicuous in fresh specimens.

Head and pronotum finely punctured, punctures separated by a distance equal to two or three times their diameter. Antennæ rather short, extending to slightly beyond the middle of the pronotum.

Mentum feebly and sparsely punctate, basal impressions rather shallow and extending broadly on to the lobes; about a fourth wider than long; apex subtruncate.

Elytral surface more or less slightly rugose apically, subtumes-

cent lines sometimes obsoletely indicated; very finely punctate. Sides of the body continuously arcuate from the head to the elytral apex in the female; in the male the pronotum may be a little wider.

Beneath finely sculptured; abdomen very finely and sparsely punctured. Prosternal process narrow, finely and sparsely punctate, more or less margined between the coxæ, but not at tip.

Length (types), 9-10 mm.; width, 3.5-4.6 mm.

Holotype, female, No. 1593, and allotype, male, No. 1594, in collection of the California Academy of Sciences. Paratypes in the Academy's and the author's collections, and in that of the American Entomological Society in Philadelphia. Type locality, Ventura, California.

Ventura is very abundant in Ventura County, especially in the vicinity of Oxnard. I am indebted to Mr. Roy E. Campbell of the United States Department of Agriculture Station at Alhambra, California, for specimens from other localities.

In *C. ventura* the mentum has the basal impressions distinct and confined to base; sides slightly arcuate; apex broadly but not deeply sinuate; angles blunt and distinct; surface sparsely punctate, very distinctly so in apical half where it is flat; prosternal process sparsely punctate and more or less margined at the sides. In *muscula* the mentum is rather short, transverse, with the basal impressions obsolete; sides moderately arcuate; apex broadly and feebly sinuate, angles obtuse and not prominent, lobes not indicated; disc feebly convex, sparsely and more or less obsoletely punctate. Prosternal process sparsely punctured and more or less margined at the sides.

Muscula is more broadly oval and not elongate, *globulina* is extremely short and stout, both being clothed with coarse decumbent hairs. *Microsticta* is narrower and less robust than *ventura,* with pubescence finer and more easily removable (cabinet specimens being generally quite denuded) and the sides of the pronotum are more convergent from base to apex. In *ventura* the sides are less convergent and more parallel in basal two-thirds, thence more strongly convergent. In *microsticta* the mentum is more or less distinctly emarginate at apex. *Inconspicua* Casey is not different from *microsticta* Casey.

In the genus *Coniontis* the specific units cannot be positively identified from detailed descriptions, for there is no other group in the coleoptera where the individuals vary to a greater extent. They must be recognized from general appearance or

habitus. Locality is of the greatest value and species described from types without definite locality should not be recognized. This statement will appear radical to some, but I have found that the units or individuals of one species frequently resemble those of another species. It so happens that no two related species inhabit the same geographical area: About San Francisco is found *eschscholtzii, nemoralis, viatica,* and *microsticta;* in Marin County *viatica, obsidiana, nemoralis, puncticollis, sanfordi,* and *subpubescens;* in Calaveras County *blaisdelli, sanfordi,* and *montana.* The variations between the individuals of *viatica, obsidiana,* and *blaisdelli* are apparently without limits. Therefore, if an example of *viatica* should not bear a definite locality label it could be referred to *obsidiana,* if it happened to be unusually large and oblong; or the reference might be to *blaisdelli* if it was slightly broader than usual and with the pronotum relatively wider than the elytra. It can readily be seen that a composite series would be formed in a collection. This is most apt to happen when details are depended upon for specific separation rather than general appearance or habitus. During the past decade I have examined hundreds of specimens and know whereof I speak. Arrange the specimens of two species according to the block system and compare the two. It will be noted that the specific differences will be accentuated and obvious.

Coniontis lamentabilis Blaisdell, new species

Form oblong-oval, cylindrical, less elongate than *ventura* and *microsticta,* more obtusely rounded anteriorly and posteriorly. Color nigro-piceous; legs more or less dark rufous, antennæ rufopiceous. Pubescence conspicuous, sparse and decumbent, pale flavate to plumbeous in color, and in certain lights silvery or golden.

Head sparsely and finely punctate, epistoma more densely punctured; frontal and oblique sutures usually distinct. Pronotum and elytra finely and not closely punctate, sides of the former parallel in basal half, thence arcuately and feebly convergent to apex. Elytra more or less slightly rugose about the apex, and at times tumescent lines are obsoletely indicated; lateral margin, in female, forming a continuous line with that of the pronotum; in the male the pronotum is usually somewhat wider at base.

Prosternal process usually margined only between the coxæ, surface sparsely and finely punctate. Parasterna and abdomen finely and sparsely punctate.

Male. Pronotum slightly wider than in the female. Form sometimes slightly cuneiform.

Length (types), 7 mm.; width, 9-2.9 mm.

Holotype, female, and allotype, male, and two paratypes in my own collection. Types and one paratype were collected at San Diego, the other paratype at Pacific Grove, Monterey County, California, all by myself.

In *lamentabilis* the mentum is transverse, about a half wider than long, with the apex transverse and more or less feebly sinuate; surface rather more roughly sculptured than in *ventura* and *microsticta*. It differs from these, also, in being shorter, more cylindrical in form and in being rather more obtuse anteriorly and posteriorly. *Parviceps* and *muscula* are broader, the former oblong-oval, the latter oval.

In *lamentabilis* I have observed a distinct molar at base of both mandibles within, similar to those described by me in *Eleodes* (Bull. 63, U. S. Nat. Mus.).

Coniontis nemoralis slevini Blaisdell, new variety

The California Academy of Sciences and the author are indebted to Mr. L. S. Slevin of Carmel, Monterey County, California, for a series of specimens of a phase of *Coniontis nemoralis* Esch., which show a noticeable divergence from the typical form. Heretofore it has been referred to *nemoralis*. When studied in a block system arrangement its differences stand out to such an extent that no doubt is entertained as to its claim to varietal standing.

Female. Form moderately elongate-oval, less robust than *nemoralis*, and more convex. Color dark nigro-piceous; legs and antennæ more or less dark rufo-piceous; surface smooth and moderately shining. Pubescence inconspicuous, consisting of sparsely placed and very short, soft hairs as in *nemoralis*.

Head finely and sparsely punctate; epistomal apex broadly, subtriangularly emarginate; emargination shallow and rounded at bottom. Pronotum very minutely and sparsely punctate, punctures more or less obsolete in the central area. Elytra very finely punctate, punctures inconspicuous; disc slightly rugose on the apical declivity. Epipleura narrow and subequal in width in basal two-thirds.

Prosternal process narrow, not margined and very sparsely, finely punctured; elsewhere beneath finely and not very distinctly punctate. Otherwise as in *nemoralis*.

Male. Rather narrower than the female, sometimes subcuneiform.

Length (types) 9-10.6 mm.; width, 4-5 mm.

Holotype, female, No. 1595, and allotype, male, No. 1596, in the collection of the California Academy of Sciences. Paratypes in the Academy's collection and in that of the author. The types were collected at Point Lobos, near Carmel, Monterey County, California, on August 1, 1919.

In *slevini* the mentum is transverse with basal impressions; disc coarsely punctate; sides moderately arcuate, apex broadly and moderately deeply emarginate; emargination nearly rounded at bottom; angles of the lobes blunt, scarcely at all rounded. In *nemoralis* the mentum is similar in form, with basal and other impressions and coarsely punctate; angles of the lobes rounded; emargination almost subtriangular. Prosternal process not margined (female) or more or less margined (male), with surface sparsely punctate.

A NEW CENTRIOPTERA FROM TEXAS

BY FRANK E. BLAISDELL, SR.
San Francisco, California

In the Proceedings of the California Academy of Sciences, Fourth Series, Vol. VII, No. 12, July 10, 1923, page 251, I gave a synoptic table of the species of Centrioptera. In that table was included the species described below; the synoptic statement gave only the salient characteristics. At that time all of the known species, with the exception of *utensis* Casey had been at hand. Since the appearance of the synoptic table two new species have been described by Colonel Casey in his Memoirs on the Coleoptera XI, 1924. His *serrata* from Las Vegas, Nevada, is unknown to me, but, from the attending remarks regarding it, must be closely related to *muricata* Lec.

I have received many specimens of *muricata* Lec. from La Puerta on the border of the Colorado Desert, Imperial County; also, from Palm Springs and Eastern San Diego County, California. It is true, as in all species, there is a marked variation in size and strength of sculpturing. These variations occur in a series from any one locality and are individual and ecological (forms). My own series demonstrate these facts. The larger specimens are more strongly sculptured than the smaller ones. I consider *elongata* Casey, recently described, as not even varietally different from *muricata* Lec.

Centrioptera texana Blaisdell, new species

Form subovate, rather robust, feebly convex on the dorsum, not strongly sculptured, a little more than twice as long as wide. Color dull black, scarcely shining.

Head moderate in size, moderately coarsely, rather evenly and quite densely punctate, surface feebly impressed; sides feebly arcuate and convergent anteriorly, angles rather narrowly rounded. Epistoma arcuato-truncate at apex. Eyes quite narrow. Antennæ moderate in length and slightly stout.

Pronotum about a third wider than long; apex broadly emarginate, transversely so in middle four-sixths, thence oblique to the acute and moderately anteriorly prominent angles; sides broadly and rather strongly arcuate, becoming sinuate and parallel in basal fifth, marginal bead rather small; base feebly and very broadly sinuate; basal angles subacute and slightly prominent posteriorly; disc very moderately convex, feebly impressed along the sides, finely and very sparsely punctate, punctures larger and more abundant along the sides in the impressed area. Propleura obsoletely rugose and opaque.

Elytra rather broadly oval, base quite truncate, humeri obtuse and distinct; sides broadly and moderately arcuate; apex rather broadly rounded and somewhat lobed; disc very feebly convex on the dorsum, strongly rounded and rather rapidly inflexed at the sides, quite strongly and rather obliquely declivous at apex, ornamented with series of feeble and elongate tubercles which are subacute posteriorly, and quite obsolete near the suture, with alternate rows of small punctures which become somewhat asperate laterally.

Meso and metasternal side pieces rather densely but not strongly punctate, sculpturing somewhat corroded. Abdomen strongly and sparsely punctate, punctures slightly coarse, more so on fifth segment; strongly rugose on first segment, less so on the second. Legs moderate in length and stoutness; rather densely sculptured.

Length, 23 mm.; width, 9.5 mm.

Type No. 1597, of doubtful sex (probably a female), in the collection of the California Academy of Sciences, collected by C. D. Duncan, at Del Rio, Valverde County, Texas, on July 27, 1921.

In *texana* the mesosternum is declivous and rather deeply impressed along the middle; prosternal process obtuse at apex and but feebly prolonged behind the coxæ, surface strongly rugoso-punctate and grooved along the median line. Mentum slightly transverse, subcordate, with the lateral lobes quite evenly rounded at apex, the latter feebly emarginate at middle. *Texana* differs from all other species in its strongly declivous mesosternum and densely, strongly, punctate head.

HESPEROCHERNES LAURÆ, A NEW SPECIES OF FALSE SCORPION FROM CALIFORNIA INHABITING THE NEST OF VESPA

BY JOSEPH CONRAD CHAMBERLIN
Riverside, California

Hesperochernes J. C. Chamberlin, new genus

Orthotype, *Hesperochernes lauræ* n. sp., California.

Tarsi single-segmented; femoral articulations all distinct, those of III and IV structurally very different from I and II (Figs. E, F); trochanter III and IV never pedicellate and always differing structurally from I and II (Figs. E, F); neither eyes nor eye-spots present; flagellum of four blades; galea slightly larger and more complex in female than in male; sub-basal and basal setæ of chelicerae both stout and with minute terminal and marginal teeth (basal seta shortest); laminal and interior setæ long, slender and acuminate, exterior seta short acuminate as is the galeal seta; lamina exterior well developed; lamina interior with a slender, dentate, terminal tooth and three more or less dentate sub-apical lobes; fingers of claw with a few accessory teeth (Figs. B, C); chætotaxy of claw as figured (Figs. B, C); poison duct of long type, in movable finger only, the nodus ramosus lying between T and ST; carapace and tergites as well as appendages more or less evenly and finely rugose; clothed with broadly dento-spatulate or clavate setæ; tactile seta of tibia and tarsus IV both lacking; tarsus IV with a dome-like "sense-spot," one-third removed from base of segment; abdomen without terminal tactile setæ; fourth legs extending even with or slightly beyond tip of abdomen; interscutal and intersegmental membranes of a rugosely wrinkled or papillate character, with the scutæ themselves small and more or less round-cornered, never sharply delimited, merging more or less gradually into the intersegmental and interscutal membranes; last four tergites and sternites slightly but distinctly recurved; male genital structures of the type here figured (Fig. I); seminal receptacles of female, as in Chernes, consisting of a pair of long, slender, more or less coiled tubes which terminate internally in a conspicuous sub-ovate enlargement; chætotaxy of vulva of type figured (Fig. J); carapace distinctly longer than greatest breadth (which point is distinctly anterior to the posterior margin); both carapacal furrows equally well developed, prominent and groove-like; the anterior furrow of the carapace slightly nearer the posterior than the anterior carapacal margin, the posterior furrow distinctly nearer the posterior border than to the anterior furrow; legs typical; coxal area of ordinary type, fairly hirsute (Fig. D); tergal and sternal border setæ numbering from 8-12 per segment.

This new genus is closely related to true Chernes, differing

therefrom principally in having one more blade in the flagellum, a carapace distinctly longer than the greatest (posterior) breadth and in possessing considerably fewer tergal and sternal border setæ. In addition to these characters the male genitalia exhibit some important differences.

No doubt some of the already described "Chelanops" of the Pacific Coast will also fall into this genus, but none can be referred hereto on the basis of the literature alone. The new genus will probably be found to be precinctive to the western portion of North America.

Hesperochernes lauræ J. C. Chamberlin, new species

Holotype, ♂, JC-530.01001; allotype, ♀, JC-530.01002, Stanford University campus, California, collected by Mr. Carl D. Duncan of San José State Teachers' College, "in the nest of the common terrestrial yellowjacket" (*Vespa occidentalis* Cr. ?), July 19, 1924. Holotype and allotype are in the author's collection. Paratypes will be deposited in the collections of the California Academy of Sciences and the Department of Entomology of Stanford University. The type collection comprises 10 adult and 4 immature individuals. A single adult female of this species was collected in the nest of a wasp (also at Stanford University) by Dr. Isabel McCracken, who very kindly turned the specimen over to the writer.

Male. Anterior carapacal furrow twice as far removed from posterior furrow as posterior furrow is from posterior carapacal margin; palpi essentially as in female (Fig. A); arrangement of tactile setæ, accessory teeth and poison duct shown in Fig. B; movable finger with about 45 sub-equally developed, contiguous, conical teeth, fixed finger with 39 or 40; sense-spots few, 1-3 at base of each finger; galea smaller than in female (Fig. G); serrula exterior with seventeen teeth, the basal one of which is double as long as the others and slenderly acute (Fig. H); anterior blade of flagellum broadest and longest, anteriorly dentate; other flagellal blades successively shorter and slenderer, the fourth very small; tergal chætotaxy, 9:9:8: 2-0/10: 2-0/10: 2-0/10: 2-0/10: 2-0/10; ventral chætotaxy (beginning with fourth segment, even with posterior spiracles), 8: 12: 16: 12: 11: 10: 10; tergal setæ broadly dento-spatulate or clavate (Fig. K); interior palpal setæ clavate, exterior less so, in some cases scarcely more than thickened dentate type; exterior setæ of 7th ventrite clavate, inner ones simple; all but median setæ of 8th ventrite clavate; all border setæ of 9-11th ventrites clavate; last ventral segments with a fair number of scattered microlyrifissures; with

about four lyrifissures to each tergite and sternite; genitalia (general appearance) as shown in Fig. I.

Female. Similar in most respects to male; palpus as shown in Fig. A; structures of claw shown in Fig. C; galea somewhat larger and more complex than in male (Fig. L); fingers of claw each with two or three more marginal teeth than in the male; chætotaxy of vulva shown in Fig. J.

Male (Holotype) JC-530.01001. Total length, 2.2 mm. K, 0.64 mm. Carapace (1.13-0.64, 0.89). Chelicera (0.32-0.17, 0.24). Palpus (0.61-0.36, 0.51-0.47) (0.60-0.31) (1.00-0.32) (0.97-0.37) (1.57-0.53) (0.82-0.22). Leg I, (0.24-0.38, 0.35-0.39) (0.23-0.16) (0.27-0.19, 0.46-0.16) (0.54-0.12) (0.53-0.08). Leg IV, (0.12-0.24, 0.35-0.32) (0.22-0.19) (0.30-0.19, 0.65-0.19) (0.81-0.13) (0.60-0.09).

Female (Allotype) JC-530.01002. Total length, 2.6 mm. K, 0.67 mm. Carapace (1.10-0.65, 0.96). Chelicera (0.38-0.18, 0.26). Palpus (0.62-0.38, 0.54-0.49) (0.65-0.34) (1.00-0.35) (0.94-0.39) (1.58-0.55) (0.81-0.21). Leg I, (0.26-0.40, 0.37-0.42) (0.23-0.18) (0.26-0.20, 0.51-0.18) (0.53-0.12) (0.52-0.09). Leg IV (0.18-0.22, 0.41-0.31) (0.26-0.23) (0.34-0.19, 0.69-0.21) (0.78-0.14) (0.63-0.10).

Remarks. Too much stress cannot be laid upon the necessity of accurate appendicular measurements in making correct determinations of species belonging to this and other related genera.

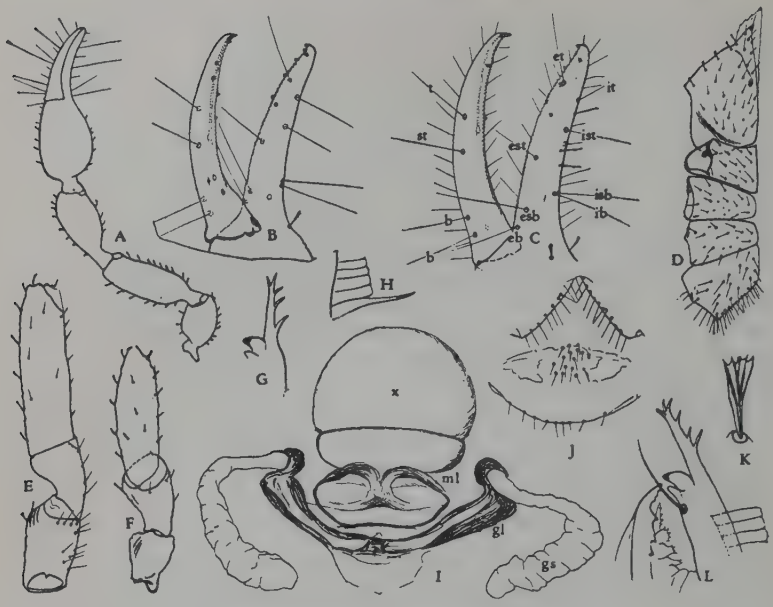
This species is named for Laura Anne Chamberlin.

Captions for Figures

(See next page)

Hesperochernes lauræ n. sp. Structural abbreviations (and mode of taking measurements) are the same as utilized by the present author in "The Cheiridiinæ of North America," Pan-Pacific Entomologist, I, pp. 32 and 40.

A, ventral aspect of right palpus. ♀ 530.01002. B, fingers of claw showing structural details. ♂ 530.01001. C, fingers of claw showing structural details. ♀ 530.01002. D, coxae of left legs. ♀ 530.01002. E, trochanter and femur of leg IV. ♂ 530.01001. F, trochanter and femur of leg I. ♂ 530.01001. G, galea. ♂ 530.01001. H, basal teeth of serrula exterior. ♂ 530.01001. I, general appearance of male genitalic structures. ♂ 530.01003. J. chætotaxy of vulva. ♀ 530.01002. K, tergal seta from median tergite. ♀ 530.01002. L, tip of chelicera of female showing structural details. ♀ 530.01002.



Hesperochernes lauræ Chamberlin.

PERSONALS

Mr. P. H. Timberlake, formerly of the Hawaiian Sugar Planters' Association of Honolulu, is now at the Citrus Experiment Station, Riverside, California, where he is associated with Professor Harry S. Smith in the study and introduction of beneficial insects.

Mr. E. P. Van Duzee has recently returned from Arizona, where, in association with Mr. J. O. Martin, he spent five weeks collecting insects for the entomological department of the California Academy of Sciences. Conditions there were unfavorable, in that the summer rainfall had been deficient and insect life had not developed as freely as usual. However, a very considerable collection of insects was obtained, among them about five thousand moths taken at light. These will supplement the fine series of Arizona moths in the Koebele collection, and gives the Academy a really valuable representation of the exceptionally interesting moth fauna of Arizona. The beetles and other insects are now in the process of mounting, and when this work is completed it is expectetd they will be found equally as interesting as the moths.

ECONOMIC NOTES

BY E. O. ESSIG
University of California, Berkeley, Calif.

The Elm-leaf Beetle in California

The elm-leaf beetle, *Galerucella xanthomelæna* (Schrank) (*G. luteola* Müller), has become firmly established in the city of Fresno, California. On a visit to that city on August 19, 1924, the writer found large and small elms on about eighty blocks infested. Many trees were completely defoliated, some having put out new growth and been denuded, three times. Two full generations of larvæ had already appeared, and larvæ and pupæ of the second brood were present in untold numbers in the cracks of the bark and on the ground about the bases of the large trees. Adults were emerging and laying eggs, and there is every indication of a full third brood before winter. Already the beetle has been carried to neighboring districts by automobiles, but the County Horticultural Commissioner, F. P. Roullard, has both the city and county united in a spray program to reduce the pest as effectively and rapidly as possible. This European pest is common in many parts of the United States east of the Rocky Mountains, and is also known in parts of Oregon and Washington in the West. This is, however, its first appearance in California, where, due to our long dry summers and mild winters, it promises to be a very severe pest to elm trees in cities.—E. O. Essig.

A Cypress Moth

A small brown pyralid moth, *Herculia phœzalis* Dyar, was taken in destructive numbers on Monterey cypress at San Diego, California, June 14, 1924, by R. R. McLean, County Horticultural Commissioner. The twigs were attacked and the cocoons, which occurred abundantly, were covered with frass and dead leaflets. The adults were determined by August Busck.—E. O. Essig.

Protection of Seed Wheat From Insects

W. W. Mackie of the Division of Agronomy, University of California, has found that the treatment of seed wheat for bunt with copper carbonate dust applied dry at the rate of two ounces

per bushel kills all the weevils and other insects and absolutely prevents reinfestation.—E. O. Essig.

The Mesquite Cutworm, Melipotis indomita Walker

Though I have noted the work of the Mesquite cutworm from year to year, this is the first season that it has occurred in alarming numbers. I obtained some idea as to the number of worms working on a single mesquite by counting those resting under the trash during the day. Under a single, average bush I was able to count over 300 worms, and there is no doubt that as many more got away when the "nest" was disturbed. The worms climb the limbs and feed on the leaves at night from the time the mesquite first buds out in the spring until June 1, when they are most numerous. About this time the worms leave their common "nest," go into the ground about one inch, and pupate. In approximately fifteen days the adult moth emerges, and may often be seen resting on rocks and sticks in shady places. Mesquite bordering the Verde River for a distance of twenty miles was practically without leaves up to June 1. After this time the plants started, slowly getting ahead of the pests, though even on the date of this writing (July 15) many bushes are thinly leaved.

I have also observed injury from the worms in the Salt River Valley near Phoenix, Arizona, and Mr. W. W. Jones reports their occurrence in the Sulphur Springs Valley near Douglas, Arizona. Observations so far indicate that the mesquite (*Prosopis glandulosa* Torr.) is the only food plant.

While rearing more than fifty moths from larvæ by cage-feeding, I obtained two separate Dipterous parasites. These were by no means numerous.—Harold R. Brisley.

Flea Larvæ in Sugar

On two occasions this summer the writer has received specimens of living flea larvæ in refined granulated sugar, one lot from Napa, and the other from Ventura, California. In both instances the larvæ were apparently normally developed and were finding the environment congenial. Infestation probably occurred in grocery stores where cats were allowed to sleep on the sacks.—E. O. Essig.

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E. P. VAN DUZEE, Editor F. E. BLAISDELL, M.D., Treasurer

EDITORIAL COMMENT

Mr. F. C. Brosius very kindly opened the rooms of the State Quarantine office in the Ferry Building for the September meeting of the Pacific Coast Entomological Society. These rooms are centrally located for all members of the Society living in the San Francisco Bay region, and proved to be well adapted for such a meeting. Mr. F. C. Brosius and Mr. George W. Wilson were most courteous hosts, and all the members present expressed the wish that we might meet there again.

At this September meeting of the Pacific Coast Entomological Society it was decided that the publication of their proceedings be continued for another year in the same form as heretofore. During the early years of the Society, the minutes of the meetings were issued to the members in mimeograph form. About 1910 the Society began their publication in printed form, and, as opportunity offered, devoted any unused funds in the hands of the treasurer to the publication of the earlier mimeographed reports, beginning with the first meeting in 1901. During the past summer, Dr. Blaisdell, secretary-treasurer of the Society, through a special appeal, raised money for the completion of this work, and at the last meeting was able to distribute to the members present the final issue of these early minutes.* Thus, the Society now has, in printed form, its complete minutes for the twenty-three years it has been in existtence. Volume I of these Proceedings consists of fifteen signatures, without pagination, covering the first to the eightieth meetings, and making a volume of 187 pages. These are offered for sale by the treasurer at $5 the volume. In binding, they should be arranged serially by the number of the meeting. Volume II began in 1921 and bears page numbers. The separate signatures of Volume II are sent free to members of the Society, others can procure them from the treasurer at 50 cents

* The publication of the minutes of the thirty-sixth meeting, completing the series, is under way. The sheet containing these minutes can be substituted for pages 77 and 78, now blank.

for each yearly number.)These Proceedings contain abstracts of papers presented to the Society and short contributions of a biological and descriptive character, and are of permanent value.

The gift by Dr. E. C. Van Dyke of his large collection of Coleoptera to the California Academy of Sciences was announced in the last number of the Pan-Pacific Entomologist. Shortly after that, and through the kind offices of Mr. W. M. Giffard of Honolulu and Mr. E. K. Taylor of Alameda, attorney for Mr. Albert Koebele, the greater part of the large and valuable collection of insects accumulated by Mr. Koebele, through many years of diligent work, was deposited in the museum of the California Academy of Sciences, reserving only the Coccinellidæ and the parasitic Hymenoptera, which went to the Hawaiian Sugar Planters' Association at Honolulu. Mr. Koebele's collection is especially strong in the Lepidoptera, containing a remarkably fine series of North American Noctuidæ, mostly determined, and an extensive series of Arizona moths. It also contains a large collection of scale insects of exceptional value. Mr. Koebele, who unfortunately is in poor health, is now living in Germany. In his absence his collection was stored in his former home at Alameda, where it was in great danger of destruction by fire and insect pests. As now placed in the Academy of Sciences, it is safe, is available for study, and constitutes a most valuable addition to the entomological resources of the Academy.

Another noteworthy addition to the department of entomology at the Academy is the collection of butterflies assembled by the late Henry M. Holbrook of San Francisco, and left by will to the Academy. This bequest was accompanied by a gift of $2000 to cover the cost of installment and proper development of the collection.

On page 43 of the July number of this journal occurs an error that requires correction. The name *"Tetrechus spinitarsis"* should read *Tachytrechus spinitarsis.*

Mr. Joseph C. Chamberlin, until recently located at Stanford University, is now at the Citrus Experiment Station, Riverside, California, assisting Professor Smith in the work of his department.